TRANSPORTATION DEMAND MANAGEMENT PROGRAM FOR THE TRANS-LAKE WASHINGTON PROJECT

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Transportation Demand Management Program for the Trans-Lake Washington Project

EXECUTIVE SUMMARY

Development of the Transportation Demand Management (TDM) Program

The development of a TDM Program for the Trans-Lake corridor focused on packaging a number of complementary strategies to enhance the efficiency of SR 520 by reducing the growth of vehicle miles traveled (VMT) in the overall SR 520 corridor and increasing person-throughput on the bridge since demand will exceed capacity on the bridge during peak periods for all of the proposed alternatives. In order to meet these goals, the TDM Program is dependent on investments in roadway, transit, high vehicle occupancy (HOV) and non-motorized facilities. While the program will support and increase the benefits of those investments, it will not replace the need for roadway investments due to the amount of latent demand in the corridor.

SR 520 Corridor TDM Program Goals

1. **Reduce Growth of VMT in Overall SR 520 Corridor**
   - Shift SOV travel to HOV travel
   - Eliminate trips or shorten distances of local travel
2. **Increase Person-Throughput on Bridge:**
   - Shift SOV travel to HOV travel
   - Shift trips out of peak travel periods
   - Eliminate trips

Implementation and Oversight of the TDM Program

The SR 520 TDM Program will be implemented through a corridor TDM and land use agreement as recommended in the first phase of the Trans-Lake Washington Study. A committee consisting of the signatory parties of the agreement (corridor jurisdictions, transportation and TDM providers) will oversee development of the agreement and implementation of the program. A technical committee consisting of staff from corridor jurisdictions, TDM and transportation providers, and other TDM experts will provide support to the oversight committee. Major employers, non-public stakeholder groups, and the region's TDM Roundtable will also be included in the implementation process in order to help facilitate an impartial monitoring, evaluation and implementation process that is not agency dependent.

Major Elements and Focus of the TDM Program

The SR 520 TDM Program, which was formatted to tie into the I-405 TDM Program in order to facilitate integration of the two corridor programs in the future, consists of an oversight program supported by five major elements:

1) Public information, education and promotion programs,
2) Vanpool programs,
3) Employer-based programs,
4) Land use as TDM, and
5) Other TDM Programs.

Strategies within the major elements of the program primarily focus on commuter incentive-based strategies since 88% of AM peak trips and 69% of PM peak trips crossing the bridge are for commuting. The strategies also focus on the seven target areas that make up the majority of trips as either origins or destinations on SR 520 (Downtown Seattle, Kirkland/Totem Lake, Redmond/Overlake, Downtown Bellevue/NW Bellevue, NW Seattle, University District, East

Central Seattle). This focus can be adjusted if needed by the oversight committee during implementation. Overlap with the I-405 program and determining early actions or TDM for construction mitigation can also be addressed during implementation planning. Although strategies such as pricing and managed lanes are not part of the TDM Program, they will be examined as part of the alternative analysis. Estimating the number of hours needed for local transit service will be part of the development of the transit modal component of the alternatives.

While carpooling is not specifically noted in the major elements described below, it is included throughout the program as a key form of ridesharing. Ridesharing is addressed in several different elements of the TDM Program with a rideshare parking program that includes carpools in the vanpool program, incentives to support carpools or other rideshare options in the employer-based programs, and with the public information campaign targeting all rideshare markets.

Oversight Program: The Oversight Program is the foundation for the full Trans-Lake Washington TDM Program. This program element provides for "adaptive management" to administer, monitor, evaluate and adjust implementation of the TDM strategies over the 20-year program period. It also includes the TDM goals supported and implemented by the corridor TDM and land use agreement, and provides for the continuation and expansion of existing TDM programs.

Public Information, Education & Promotion Programs: The programs in this element complement and increase the effectiveness of all other TDM elements. These programs include a new corridor-focused information and education campaign that targets commute trips but provides outreach for non-commute trips including markets such as little leagues and high schools; expansion of traveler information services including some Intelligent Transportation System (ITS) strategies; and new services to provide personalized trip planning to travelers in the SR 520 corridor.

Vanpool Programs: Vanpools are a proven TDM strategy in the Puget Sound area for reducing commuter trips by shifting (single occupant vehicle) SOV travel to HOV travel and are a key element of the Trans-Lake TDM Program. This element has a larger focus than the seven target areas with a program that significantly increases vanpooling for both the SR 520 and I-90 bridges by providing for extensive new marketing of public vanpool programs; assistance in acquiring new vanpool vehicles; rideshare parking program to supplement permanent park-and-ride lots; and incentives for vanpool fare subsidy, affinity products, and owner-operated vanpooling promotion.

Employer-Based Programs: This element focuses on further reduction of commute trips or shifting of commute trips out of peak periods by providing significant new support to employers and private sector programs; programs to increase the use of work schedule options; additional incentives and resources for Commute Trip Reduction (CTR) and non-CTR affected employers; support for Transportation Management Associations (TMAs); and promotion of parking cashout programs.

Land Use as TDM: This element supports implementation of land use patterns that reduce or change demand on the transportation system by increasing access to transit and non-motorized facilities and services or by shortening the length of trips. This element would provide support programs for local jurisdictions and developers; incentives for jurisdictions, developers and businesses; and funding for local connectivity projects.

Other TDM Programs: The components of this element enhance the effects of the other elements but do not fit into one category. This element provides innovative fare media; non-

commute trip TDM programs; incentives for freight and commercial vehicles; custom bus services; and funding for demonstration projects.

Estimated 20-Year Investment Costs of the TDM Program
The following estimate shows 20-years of investment in TDM based on historical costs for staff and incentive programs. It is varied by alternative based on:

- The level of TDM-supportive infrastructure and services within the alternatives,
- How much benefit can be captured from TDM investments based on how much the alternative supports TDM,
- How much need or demand there is for TDM investment, and
- How much investment is needed to keep trips within the corridor that should occur in the corridor.

Major Program Elements	4-Lane Alternative TDM Program	6-Lane Alternative TDM Program	8-Lane Alternative TDM Program
Oversight Program	25,000,000	20,000,000	20,000,000
Public Information & Education Programs	60,000,000	50,000,000	40,000,000
Vanpooling (includes I-90)	40,000,000	35,000,000	30,000,000
Employer-Based Programs	95,000,000	75,000,000	60,000,000
Land Use as TDM	45,000,000	45,000,000	45,000,000
Other TDM Programs	65,000,000	60,000,000	50,000,000
TOTAL 20-YEAR COSTS	**$330,000,000**	**$285,000,000**	**$245,000,000**

All investment costs are shown in Year 2001 dollars. The costs will be adjusted during the analysis of the alternatives to account for the impacts of inflation. The estimated costs are for a 20-year time frame in order to be consistent with and comparable to the I-405 TDM Program. However, in order to tie into the same time frame of analysis of other elements within the Trans-Lake alternatives (2030), the estimated costs will be updated to 30-years of investment for the alternative analysis. A cost/benefit analysis will be done as part of the alternative analysis. Since demand far exceeds capacity of the alternatives been considered, a package of build, multi-modal and TDM strategies is needed. The cost/benefit analysis will be only for the package of strategies, not for TDM or any of the other individual elements within an alternative, due to this need for a package.

Estimated Effectiveness of the TDM Program
The estimated impacts of the entire TDM program, shown below, on trip-making in the SR 520 corridor are by measures that relate to the program's goal to reduce growth of VMT in the overall SR 520 corridor and to increase person throughput on the bridge. The estimated impacts of TDM by alternative may already be included in the model to some degree. What portion of the program is needed to meet the model's assumptions for the region will need to be determined and will be examined during alternative analysis.

Impacts on Trip-Making in the SR 520 Corridor	4 Lanes	6 Lanes	8 Lanes
Reduce Growth of Daily VMT in Overall Corridor	2-5%	4-7%	3-6%
Reduce Growth of AM Peak VMT in Overall Corridor	7-12%	12-18%	10-15%
Increase Person-Throughput on Bridge	6-8%	8-10%	6-8%

BACKGROUND

December 2001 Draft TDM Program

A draft Transportation Demand Management (TDM) Program for the SR 520 corridor was presented to the Trans-Lake Washington Project's Executive, Technical Steering and Advisory Committees at an all-committee meeting in December 2001. An analysis of that draft program assessed the likely impacts of the program in conjunction with transit and highway improvements. Key findings from the analysis that were used as guiding principles to develop the recommended program include:

- TDM increases person-throughput and enhances the other mobility actions in the corridor by supporting increases in high vehicle occupancy (HOV) and transit use. TDM is dependent on other efforts to manage demand such as the major HOV and transit capital improvements in the corridor that are included in the 6 and 8 lane alternatives. It is also dependent on implementation of the region's long-range plans to focus population and employment growth into major centers that are connected by multi-modal corridors.
- TDM actions for a corridor program should focus on amplifying the application of existing regional, sub-area or local programs within the corridor in order to address the specific problems and needs within the corridor to the greatest extent.
- Trans-Lake Washington corridors have a much higher degree of work trips than other corridors in the region, especially at the mid-point of the SR 520 and I-90 floating bridges, confirming that commute trip-based strategies would be the most beneficial to those facilities.
- Seven areas make up the majority of trips in the SR 520 corridor (combined origins and destinations) and are the best areas to focus on for TDM investment: Downtown Seattle, Kirkland/Totem Lake, Redmond/Overlake, Downtown Bellevue/Northwest Bellevue, Northwest Seattle, University District, and East Central Seattle.
- The 4-lane alternatives would present the greatest challenge for TDM because they do not improve HOV or transit facilities in the SR 520 corridor. The most aggressive TDM Program should be developed for these alternatives in order to maximize person-throughput.
- The strategies within the TDM Program are based on incentives, information and promotion as suggested by the corridor participants. Strong disincentives to drive-alone trips, such as imposing tolls or corridor pricing or increasing parking costs at major destinations, could be considered in order to increase the effectiveness of the TDM Program. Managed lanes could also positively impact the effectiveness of the program.
- The inclusion in a corridor plan of a significant investment in a package of complementary TDM strategies, and implementation of the TDM strategies through a corridor agreement, illustrates a new approach for the state in planning urban corridor improvements.

Revision of the December 2001 Draft TDM Program

The draft TDM program presented to the committees in December, shown as "December 2001 Draft TDM Program" in the following table, was revised based on input from the all-committee meeting which included:

1. Expanding the program to have a more substantial commitment of resources to TDM,
2. Providing more specific information on elements within the program,
3. Providing a program that would vary TDM investments according to the number of lanes in the alternatives, and
4. Formatting the program to tie into the I-405 TDM Program due to the geographic overlap of the two programs and to facilitate integration of the two programs in the future.

The revised program, shown as "Recommended 4, 6 or 8-Lane Alternative TDM Program" in the following table, also took into consideration findings from the analysis of the December 2001 TDM Program including:

1. Focusing on commute trip-based strategies,
2. Addressing the need for a more aggressive TDM package for 4-lane alternatives, and
3. Focusing TDM investments on the seven areas that make up the majority of trips.

The following table provides an overview of the estimated 20-year TDM investment costs for the SR 520 corridor for both the draft and recommended TDM programs by major program elements. All investment costs shown in the table are in Year 2001 dollars. The costs for the recommended program will be adjusted during the analysis of the alternatives to account for the impacts of inflation. The estimated costs are for a 20-year time frame in order to be consistent with and comparable to the I-405 TDM Program. However, in order to tie into the same time frame of analysis of other elements within the Trans-Lake alternatives (2030), the estimated costs will be updated to 30-years of investment for the alternative analysis.

Estimated 20-Year Investment Costs for SR 520 Corridor TDM Program

Major Program Elements	December 2001 Draft TDM Program	Recommended 4-Lane Alternative TDM Program	Recommended 6-Lane Alternative TDM Program	Recommended 8-Lane Alternative TDM Program
Core Program		25,000,000	20,000,000	20,000,000
Public Information & Education Programs	15,000,000	60,000,000	50,000,000	40,000,000
Vanpooling (includes I-90)	15,000,000 to 20,000,000	40,000,000	35,000,000	30,000,000
Employer-Based Programs	80,000,00 to 115,000,000	95,000,000	75,000,000	60,000,000
Land Use as TDM	20,000,000	45,000,000	45,000,000	45,000,000
Other TDM Programs	10,000,000	65,000,000	60,000,000	50,000,000
TOTAL 20-YEAR COSTS	**$140,000,000 to $180,000,000**	**$330,000,000**	**$285,000,000**	**$245,000,000**

More detailed information on the development of December 2001 Draft TDM Program and initial TDM program recommendations is provided on pages 1-1 through C-26 of this report. Some of information and initial recommendations within those pages do not always correlate to the Recommended TDM Program since the report on the draft program was finalized before the Recommended SR 520 TDM Program was completed. These pages are included to provide background information on the analysis of the draft program.

The Executive Summary of this report provided an overview of the Recommended SR 520 TDM Program. The following sections provide more detail on the development of the Recommended SR 520 TDM Program, what strategies are within the major program elements, and how costs and effectiveness of the program were estimated.

RECOMMENDED SR 520 TDM PROGRAM

Development of the Recommended 20-Year SR 520 Corridor TDM Program
Transportation Demand Management (TDM) is defined, for the Recommended SR 520 TDM Program, as a broad range of actions and strategies that support and increase efficiency of the transportation system by reducing or changing travel demand on the system.

Development of a TDM Program for the Trans-Lake corridor focused on packaging a number of complementary strategies to enhance the efficiency of SR 520 by reducing the growth of vehicle miles traveled (VMT) in the overall SR 520 corridor and increasing person-throughput on the bridge since demand will exceed capacity on the bridge during peak periods for all of the proposed alternatives.

In order to meet these primary goals, the TDM Program is dependent on investments in roadway, transit, HOV and non-motorized facilities and services. While TDM will support and increase the benefits of those investments, it will not replace the need for roadway investments due to the amount of latent demand within the corridor.

SR 520 Corridor TDM Program Primary Goals

1. **Reduce Growth of VMT in overall SR 520 Corridor**
   - Shift SOV travel to HOV travel
   - Eliminate trips or shorten distances of local travel
2. **Increase Person-Throughput on Bridge:**
   - Shift SOV travel to HOV travel
   - Shift trips out of peak travel periods
   - Eliminate trips

In addition to the two primary goals for the TDM Program, other goals include:
1. Enhancing investments in roadway, transit, HOV and non-motorized facilities and services,
2. Increasing the efficiency of the transportation system, by:
   - Providing information that increases public awareness of alternative modes of travel,
   - Providing programs and incentives to increase access to transit, HOV and non-motorized facilities and services; and
   - Providing staff support and incentives to link land use and transportation actions through the implementation of transportation-efficient land use (i.e., land use - such as transit-oriented development - that reduces the length of trips, eliminates trips, or reduces drive-alone vehicular trips by being transit-supportive, providing accessible and safe non-motorized facilities, having mixed-use developments, etc.).

The TDM Program focuses on the transportation needs for the SR 520 corridor over the next 20 years and incorporates both the input from the Trans-Lake Washington Project's committees and findings from the analysis of the draft program. The program is anchored in the real-world TDM experience and expertise in the Puget Sound area. During the past twenty-five years, the region has strengthened its commitment to demand management, with programs like carpool ridematching, vanpooling, Flexpass, assistance with work scheduling and telework, Transportation Management Associations (TMAs), Commute Trip Reduction (CTR) services, and the region's TDM Resource Center. The program was formatted to tie into the TDM Program for the I-405 corridor in order to facilitate potential integration of the two corridor programs in the future. A key component of the TDM Program is a corridor TDM and land use agreement, which was a recommendation from the first phase of the Trans-Lake Washington Study, to implement TDM and land use actions in the corridor.

Corridor TDM and Land Use Agreement
A framework TDM and land use corridor agreement to implement the Trans-Lake TDM Program will be developed under a grant funded by the Federal Transit Administration (FTA) and Washington State Department of Transportation (WSDOT). Development of the agreement will be coordinated with corridor jurisdictions and transportation and TDM providers to provide a framework agreement that outlines the expected actions and commitments of the parties involved in implementation. The agreement would include:

- TDM goals for key activity areas within the SR 520 corridor,
- A process to administer, update or modify the agreement or goals,
- A process to monitor, assess and adjust implementation of the strategies to support attaining the goals, and
- Structure and oversight for the TDM program.

Oversight of the TDM Program
Oversight of the TDM Program is based on the format for the I-405 TDM Program that responds to the need for flexibility and accountability of the program during implementation. Given the program's variety of strategies and interdependency of various strategies, flexibility to adjust the strategies over time is needed in order to support meeting the corridor TDM and land use agreement's goals. Accountability for how the TDM Program is implemented and performance of the program would be addressed by establishing an executive-level oversight committee, composed of the parties participating in the corridor agreement (corridor jurisdictions, transportation and TDM providers) to monitor program performance and to adjust the TDM strategies and funding allocations if needed. The oversight committee would meet on an annual basis to review monitoring and performance reports for the program and to make any needed adjustments to the program.

A technical steering committee, consisting of staff from TDM and transportation providers and other TDM experts meeting on a quarterly basis, would also be formed to guide implementation of the program and to contribute to the monitoring and performance reports and any recommendations to the oversight committee to adjust the program. WSDOT staff would provide support to the committees and central management support for the overall TDM Program.

Involvement of major employers and non-public stakeholder groups such as neighborhood or advocacy groups will also be sought to include their participation in the implementation, monitoring and oversight process for the TDM Program. The region's TDM Roundtable - a group that is composed of representatives from a variety of groups that would be above individual agencies - will also be involved in this process in order to help facilitate an impartial monitoring, evaluation and implementation process than is not agency dependent.

Major Elements of TDM Program
The TDM Program consists of an oversight program supported by five major elements:

1) Public information, education and promotion programs,
2) Vanpool programs,
3) Employer-based programs,
4) Land use as TDM, and
5) Other TDM Programs.

Strategies within the major elements of the program primarily focus on commuter incentive-based strategies since 88% of AM peak trips and 69% of PM peak trips crossing the bridge are for commuting. The strategies also focus on the seven target areas that make up the majority of trips

as either origins or destinations on SR 520 (Downtown Seattle, Kirkland/Totem Lake, Redmond/Overlake, Downtown Bellevue/NW Bellevue, NW Seattle, University District, East Central Seattle). This focus can be adjusted if needed by the oversight committee during implementation. Overlap with the I-405 program and determining early actions or TDM for construction mitigation can also be addressed during implementation planning. Although strategies such as pricing and managed lanes are not part of the TDM Program, they will be examined as part of the alternative analysis. Estimating the number of hours needed for local transit service will be part of the development of the transit modal component of the alternatives.

While carpooling is not specifically noted in the major elements described below, it is included throughout the program as a key form of ridesharing. Ridesharing is addressed in several different elements of the TDM Program with a rideshare parking program that includes carpools in the vanpool program, incentives to support carpools or other rideshare options in the employer-based programs, and with the public information campaign targeting all rideshare markets.

Oversight Program: The Oversight Program is the foundation for the full Trans-Lake Washington TDM Program. It establishes a collaborative process to guide SR 520 corridor TDM services and establishes the organizational framework for implementation of the corridor TDM program. Estimated investment costs for this program are approximately 7% of the entire TDM Program with $25,000,000 for the 4-lane alternative and $20,000,000 for the 6 -lane alternative, and $20,000,000 for the 8-lane alternative (more detailed information on estimating costs for all of the elements are pages 13 to 19).

The oversight program provides staffing, materials and incentives to:

- Provide "adaptive management" that administers, monitors, evaluates and adjusts implementation of the TDM strategies over the 20-year program period,
- Support implementation of the TDM goals in the corridor TDM and land use agreement,
- Support the continuation and expansion of existing TDM programs such as HERO.

This program should be included as part of any early action items or TDM during construction since it provides the basic structure for implementing the entire SR 520 TDM Program.

Public Information, Education & Promotion Programs: The programs in this element complement and increase the effectiveness of all other TDM elements. It is designed to increase awareness and use of travel options through focused informational and educational support services and to keep the public highly informed about transportation issues, construction activities and travel in the SR 520 corridor. The estimated investment costs for this element are approximately 18% of the entire TDM Program with $60,000,000 for the 4-lane alternative, $50,000,000 for the 6-lane alternative, and $45,000,000 for the 8-lane alternative. The programs in this element provides staffing and materials for:

- A new corridor-focused information and education campaign that targets commute trips but also provides outreach for non-commute trips including markets such as little leagues and high schools,
- Expansion of traveler information services including some Intelligent Transportation System (ITS) strategies, and
- New services to provide personalized trip planning to travelers in the SR 520 corridor.

In order to foster public awareness of the SR 520 TDM Program and different travel options, this program should be initiated before roadway construction projects impact travelers.

Vanpool Programs: Vanpools are a proven TDM strategy in the Puget Sound area for reducing commuter trips by shifting (single occupant vehicle) SOV travel to HOV travel and are a key element of the Trans-Lake TDM Program. This element has a larger focus than the seven target areas with a program that significantly increases vanpooling for both the SR 520 and I-90 bridges by providing:

- Extensive new marketing of public vanpool programs including promotion of owner-operated vanpooling,
- Assistance in acquiring new vanpool vehicles,
- Rideshare parking program to supplement permanent park-and-ride lots,
- Vanpool fare subsidy,
- Incentives for affinity products.

This program will provide staffing and incentives to support the addition of 260 new vanpools within the SR 520 and I-90 corridors over the 20-year program period. The number of new vanpools is calculated on the market potential to increase vanpools in the two corridors by five-fold based on a recent study of the region's vanpool market. The estimated investment costs for this element are approximately 12% of the entire TDM Program with $40,000,000 for the 4-lane alternative, $45,000,000 for the 6-lane alternative, and $30,000,000 for the 8-lane alternative.

Vanpooling is an effective construction mitigation technique that captures the market that cannot be served by transit and should be implemented early and aggressively due to its ability to remove commuter SOVs from the road, easy identification for HOV priority access, and its market potential in the corridor.

Employer-Based Programs: This element focuses on further reduction of commute trips or shifting of commute trips out of peak periods by providing:

- Significant new support to employers and private sector programs,
- Programs to increase the use of work schedule options,
- Additional incentives and resources for Commute Trip Reduction (CTR) and non-CTR affected employers,
- Support for Transportation Management Associations (TMAs), and
- Promotion of parking cashout programs.

The staffing and incentives provided by this element is an important component of the TDM program due to the high amount of commute trips in the corridor which can be influenced at employment sites. The estimated investment costs for this element are approximately 26% of the entire TDM Program with $95,000,000 for the 4-lane alternative, $75,000,000 for the 6-lane alternative, and $60,000,000 for the 8-lane alternative.

This program should be part of any early action or construction mitigation activities given the high effectiveness of the programs in this element to influence commute trips.

Land Use as TDM: This element supports implementation of land use patterns that reduce or change demand on the transportation system by increasing access to transit and non-motorized facilities and services or by shortening the length of trips. It provides staff support and incentives to link land use and transportation actions through the implementation of transportation-efficient land use (i.e., land use - such as transit-oriented development - that reduces the length of trips, eliminates trips, or reduces drive-alone vehicular trips by being transit-supportive, providing accessible and safe non-motorized facilities, having mixed-use developments, etc.). This element would provide:

- Support programs for local jurisdictions and developers,
- Incentives for jurisdictions, developers and businesses, and
- Funding for local connectivity projects.

The land use assistance programs would provide support to jurisdictions to do activities to support implementation of transportation-efficient land use (i.e., code updates, utility planning, streamlining permitting processes) and to developers during the design review and permitting processes. The estimated investment costs for this element are approximately 16% of the entire TDM Program with $45,000,000 for each of the alternatives. Since land use strategies take a longer time to generate impacts on trip-making than other TDM strategies, this element would not need to be included in early action or construction mitigation activities.

Other TDM Programs: The components of this element enhance the effects of the other elements but do not fit into one category. This element provides:

- Innovative fare media such as Flexpass, residential passes or University of Washington's UPASS
- Non-commute trip TDM programs,
- Incentives for freight and commercial vehicles,
- Custom bus services, and
- Funding for demonstration projects.

Each of these strategies is expected to have a high impact, although most require new research and development activities. The estimated investment costs for this element are approximately 21% of the entire TDM Program with $65,000,000 for the 4-lane alternative, $60,000,000 for the 6-lane alternative, and $50,000,000 for the 8-lane alternative. Most of the programs in this element would not need to be included in early action or construction mitigation activities since the programs will be developed and implemented on an incremental basis following research and testing of new concepts.

Estimated 20-Year Investment Costs of the TDM Program
The table below shows an estimate of 20-years of investment in TDM for the SR 520 corridor based on historical costs for staff and incentive programs.

Major Program Elements	4-Lane Alternative TDM Program	6-Lane Alternative TDM Program	8-Lane Alternative TDM Program
Oversight Program	25,000,000	20,000,000	20,000,000
Public Information & Education Programs	60,000,000	50,000,000	40,000,000
Vanpooling (includes I-90)	40,000,000	35,000,000	30,000,000
Employer-Based Programs	95,000,000	75,000,000	60,000,000
Land Use as TDM	45,000,000	45,000,000	45,000,000
Other TDM Programs	65,000,000	60,000,000	50,000,000
TOTAL 20-YEAR COSTS	**$330,000,000**	**$285,000,000**	**$245,000,000**

All investment costs are shown in Year 2001 dollars. The costs will be adjusted during the analysis of the alternatives to account for the impacts of inflation. The estimated costs are for a 20-year time frame in order to be consistent with and comparable to the I-405 TDM Program. However, in order to tie into the same time frame of analysis of other elements within the Trans-Lake alternatives (2030), the estimated costs will be updated to 30-years of investment for the alternative analysis. A cost/benefit analysis will be done as part of the alternative analysis. Since

demand far exceeds capacity of the alternatives been considered, a package of build, multi-modal and TDM strategies is needed. The cost/benefit analysis will be only for the package of strategies, not for TDM or any of the other individual elements within an alternative, due to this need for a package.

The tables on pages 13 to 19 show the estimated level of TDM investments, for major program elements by the number of lanes in an alternative, that are needed to support the TDM Program's goals to reduce rate of growth of VMT in the overall SR 520 corridor and increase person-throughput on the bridge. The program focuses on commuter incentive-based strategies within the SR 520 corridor that are focused on the seven target areas that make up the majority of trips as either origins or destinations on SR 520 (Downtown Seattle, Kirkland/Totem Lake, Redmond/Overlake, Downtown Bellevue/NW Bellevue, NW Seattle, University District, East Central Seattle). Vanpool Programs have a larger focus than the seven target areas by including vanpools for both the SR 520 and I-90 bridges.

The approach for estimating the capital and operating costs of the TDM strategies was based on information gathered from corridor jurisdictions, transit agencies, existing TDM programs, other support and marketing programs, and TDM and marketing experts. This information was used to estimate costs for the strategies within the program based on historical costs for incentives and marketing. The information was also used to estimate the number of full-time employees (FTEs) needed to implement a program and to estimate costs for staff support based on the number of FTEs and related material and overhead costs. Capital and operating costs were calculated for the oversight program and each major element, and then combined for a total 20-year cost for the entire TDM program.

The estimated level of investments for each element reflects the approach to varying investments by alternative described in the following section, with the 4-lane alternative having the highest level of investment and the 8-lane alternative having the lowest level of investment. The variation in investments is due primarily to different levels of incentives or resources needed to support implementation of the TDM strategies in an alternative. Some staff programs within an element have the same level of investment for each alternative since the staff needed to implement the element would be the same for all of the alternatives.

The Land Use as TDM is the one element that does not have investments varied by alternative. The land use element supports implementation of land use patterns ("transportation-efficient land use") that reduce or change demand on the transportation system by increasing access to transit and non-motorized facilities or by shortening the length of trips. The intent of this element is to support short range localized trips that can be made without the use of arterials that connect to state highways. Since there are not viable parallel routes to the SR 520 bridge and a limited number of highway arterials where land use as a TDM strategy could influence localized trips, the level of investment for the land use element is the same for all alternatives.

Approach to Varying the Level of TDM Investment by Alternative

TDM investment costs are varied by alternative based on:

- The level of TDM-supportive infrastructure and services within the alternatives,
- How much benefit can be captured from TDM investments based on how much the alternative supports TDM,
- How much need or demand there is for TDM investment, and
- How much investment is needed to keep trips within the corridor that should occur in the corridor.

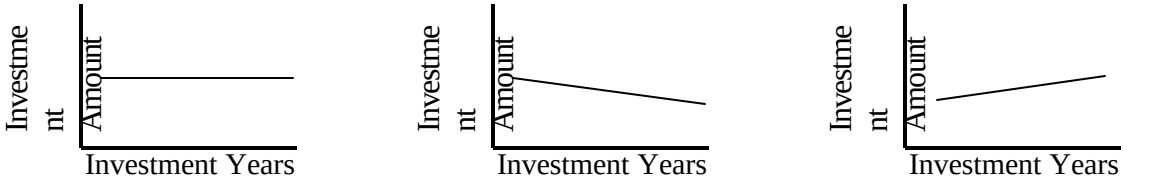
The highest estimated amount of TDM investments is for 4-lane alternatives since it will probably be harder to maintain person-throughput in conditions where TDM-supportive infrastructure such as new HOV lanes is not added. Since this alternative will not increase roadway capacity, it will probably have the highest demand for TDM and the greatest need to address the issue of people switching over to other routes.

The estimated investment level decreases for 6-lane alternatives since the effectiveness of TDM to reduce growth of VMT in the overall corridor and increase person-throughput on the bridge is more likely to happen more spontaneously in conditions that support TDM such as new HOV lanes, new bicycle/pedestrian facilities, and increased transit services.

The lowest level of estimated investment is for 8-lane alternatives since person-throughput on the bridge is supported by both TDM-supportive infrastructure and services and increased vehicular capacity in new general purpose (GP) lanes. Higher level of investments for the 8-lane alternatives may not be beneficial since the HOV lane would probably not have as competitive travel times as the HOV lane in the 6-lane alternative and it will probably be harder to increase TDM effectiveness in conditions that provide additional vehicular capacity. Increasing TDM effectiveness in 8-lane alternatives may need consideration of strategies such as managed lanes or disincentives to drive-alone trips such as imposing tolls or corridor pricing or increasing parking costs at major destinations.

Approach to Varying the Timing of TDM Investments by Alternative

Three different time frames of TDM investments are proposed based on the number of lanes for an alternative as shown in the charts below. Investments could be level across the 20-year program for 4-lane alternatives since there will be a significant need for TDM throughout the entire 20 years in conditions where additional HOV capacity is not provided. Investment for 6-lane alternatives could initially be higher to capture the TDM market when additional HOV capacity is first added, but would gradually decrease as demand exceeded capacity on GP lanes to the point where it will probably be easier to capture the TDM market. Investment for 8-lane alternatives could initially start lower since additional capacity from both HOV and GP improvements would probably make it harder to capture the TDM market when the capacity is first added, but investment would probably need to gradually increase as demand increased on both HOV and GP lanes.



4-Lane Alternatives **6-Lane Alternatives** **8-Lane Alternatives**

ESTIMATED 20-YEAR INVESTMENT COSTS FOR THE SR 520 CORRIDOR TDM PROGRAM

OVERSIGHT PROGRAM	**4-Lane Alternatives** (7.6%*)		**6-Lane Alternatives** (7.0%)		**8-Lane Alternatives** (8.2%)	
Components	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**
Expanded Existing TDM Programs: Provide 3 full-time employees (FTEs)** and materials to expand existing programs such as HERO and to support other TDM services that experience significant increases in demand.		15,000,000		10,000,000		10,000,000
Corridor Agreement Program: Provide ½ FTE and materials to develop the agreement and for reimbursing participating agencies for staff to periodically monitor the agreement or develop sub-agreements.		1,500,000		1,500,000		1,500,000
Oversight, Monitoring and Evaluation: Provide 2 FTEs and materials to develop information to guide decision-making about implementing the TDM program and staffing for central administration, monitoring and evaluation of the program.		8,500,000		8,500,000		8,500,000
Capital and Operating Subtotals		25,000,000		20,000,000		20,000,000
Total 20-year costs		$25,000,000		$20,000,000		$20,000,000

*Indicates what percent the element is of the entire program (typical).

**The numbers of FTEs listed in the investment costs tables are estimates for the level of staff support needed for a program within a major element. Although the location of the FTEs are not known at this time (it is likely there will be multiple locations), this will be addressed in the implementation planning process.

PUBLIC INFO, ED & PROMO	**4-Lane Alternatives** (18.2%)		**6-Lane Alternatives** (17.5%)		**8-Lane Alternatives** (16.4%)	
Components	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**
Education, awareness & promotion campaign: Provide 3-5 FTEs, materials and media for a new major corridor campaign focused on travel in the corridor for commute/rideshare and non-commute markets, and to coordinate information programs such as websites, corridor-wide promotions, education and special events.		30,000,000		25,000,000		20,000,000
Traveler information system: Provide 1 FTE and materials to expand use of interactive rideshare and transit information.		5,000,000		5,000,000		5,000,000
Personalized trip planning assistance: Provide 1-3 FTEs to develop new systems to provide custom, one-on-one assistance to corridor travelers.		15,000,000		10,000,000		5,000,000
ITS applications such as variable message signs (VMS) or "bus-view" signing (signing at bus stops providing "real time" information): Provide 1-2 FTEs, materials and some infrastructure to expand use of ITE technology.	1,000,000	9,000,000	1,000,000	9,000,000	1,000,000	9,000,000
Capital and Operating Subtotals	1,000,000	59,000,000	1,000,000	49,000,000	1,000,000	39,000,000
Total 20-year costs		$60,000,000		$50,000,000		$40,000,000

VANPOOL PROGRAMS: Includes vanpools for both SR 520 and I-90 bridges & rideshare parking program inclusive of carpools

4-Lane Alternatives (12.1%) **6-Lane Alternatives** (12.3%) **8-Lane Alternatives** (12.2%)

Components	Capital Costs	Operating Costs	Capital Costs	Operating Costs	Capital Costs	Operating Costs
Vanpool marketing & management program: Provide 3-4 FTEs and materials for new marketing materials and campaigns for vanpooling including promotional materials for owner-operated vanpools. The 3-4 FTEs will also manage all other vanpool programs except the park-and-ride program, and will provide support to employer-based programs.		12,500,000		12,500,000		10,000,000
260 new vanpool vehicles: Provide revolving fund for 260 vans (estimated 380 new vans on SR 520 & I-90 bridges over 20-year program, funding provided for 260 vans by TDM Program based on a 6-year van replacement schedule, funding for 120 vans provided by transit agencies as part of "no action" alternative). The vanpool program would add 13 new vanpools each year of the 20-year program, with the vans being resold (and replaced) after 6 years of use. New vans are estimated at a cost of $22,000 each with a resale value of 35% of the original value ($7,700), based on local transit agencies' experience. Monies from the resale of vans would "revolve" through the program to help cover capital costs of the replacement vans.	10,000,000		10,000,000		10,000,000	

VANPOOL PROGRAMS continued: Includes vanpools for both SR 520 and I-90 bridges & rideshare parking program inclusive of carpools

	4-Lane Alternatives (12.1%)		**6-Lane Alternatives** (12.3%)		**8-Lane Alternatives** (12.2%)	
Components	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**
Rideshare parking program: Provide 1 FTE and funding for a voucher program or leased lots for van/carpools ("placeholder" amount for vouchers or leased lots is based on $120 per month per van for ½ of 475 new and existing vans, permanent parking to be provided for other ½ of 475 vans in capital program for transit).		7,500,000		7,500,000		7,500,000
Vanpool fare subsidy: Provide reserve fund for 475 vans (260 new vans from TDM Program, 120 new vans from transit agencies, 95 existing vans), "placeholder" amounts based on 25% fare subsidy for 4-lane, 12-18 month start-up for 6-lane, 1-3 month start-up for 8-lane.		8,000,000		3,000,000		500,000
Affinity products: Provide funding for new "value-added" incentives such as frequent flyer miles for vanpoolers ("placeholder" amount based on cumulative funding starting with $10,000 the 1st year and adding $10,000 each year to the previous year total for 20 years).		2,000,000		2,000,000		2,000,000
Capital and Operating Subtotals	10,000,000	30,000,000	10,000,000	25,000,000	10,000,000	20,000,000
Total 20-year costs		$40,000,000		$35,000,000		$30,000,000

EMPLOYER-BASED PROGRAMS	**4-Lane Alternatives** (28.8%)		**6-Lane Alternatives** (26.3%)		**8-Lane Alternatives** (24.5%)	
Components	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**
Work choices program: Provide 2 FTEs, materials and incentives to support strategies that change employee commutes such as telecommute, flextime, compressed work schedules, multiple shifts, or proximate commuting ("placeholder" amount of approximately $250,000 per year for incentives and promotion). The 2 FTEs will also staff other employer-based programs with support from the vanpool programs' FTEs.		15,000,000		10,000,000		10,000,000
Commute Trip Reduction (CTR) program: Provide staff support and incentives for increasing use of strategies such as rideshare at CTR-affected employment sites ("placeholder" amount based on historic CTR data for B&O tax incentives)		50,000,000		40,000,000		30,000,000
Incentives & support program for CTR-type voluntary program for employers not affected by CTR law ("placeholder" amount based on historic CTR data for B&O tax incentives)		20,000,000		15,000,000		10,000,000
Transportation Management Associations (TMAs) assistance program. A TMA is an independent entity (e.g., private non-profit) set up to address transportation issues and opportunities in a specific geographic area. Provide funding to help cover core operational costs of 2 existing TMAs and to start 1-2 new TMAs.		5,000,000		5,000,000		5,000,000
Parking cashout incentives: Provide incentives to CTR employers with "placeholder" of $250,000 per year.		5,000,000		5,000,000		5,000,000
Capital and Operating Subtotals		95,000,000		75,000,000		60,000,000
Total 20-year costs		$95,000,000		$75,000,000		$60,000,000

LAND USE AS TDM	**4-Lane Alternatives** (13.6%)		**6-Lane Alternatives** (15.8%)		**8-Lane Alternatives** (18.4%)	
Components	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**
Land use assistance program: Provide 2-3 FTEs to provide staff support to developers during the design review & permitting process, and to jurisdictions to do activities (i.e., code updates, utility planning) to support implementation of transportation-efficient land use, and to manage other land use programs.		8,000,000		8,000,000		8,000,000
Land use incentives program: Provide incentive funding to jurisdictions to support implementation of transportation-efficient land use for activities such packaging of parcels, improving infrastructure etc. in key activity areas; "placeholder" amount based on local historical costs for items such as FAR bonuses (FAR is floor area ratio, a measure typically used for commercial density, with FAR bonuses allowing increased density in exchange for other items that support local goals) or B&O tax to developers or businesses in key activity areas		28,500,000		28,500,000		28,500,000
Local connectivity retrofitting projects: Provide funding ("placeholder" amount) for reducing barriers to non-motorized travel in key activity areas such as fence removal and sidewalk extension, sidewalk extension to transit stops, curb bulbs, etc.	8,500,000		8,500,000		8,500,000	
Capital and Operating Subtotals	8,500,000	36,500,000	8,500,000	36,500,000	8,500,000	36,500,000
Total 20-year costs		$45,000,000		$45,000,000		$45,000,000

OTHER TDM PROGRAMS	**4-Lane Alternatives** (19.7%)		**6-Lane Alternatives** (21.1%)		**8-Lane Alternatives** (20.3%)	
Components	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**
Innovative fare media: Provide funding for demonstrations, incentives, matching funds, fare media and staffing for area-wide "Smart Card"/Flexpass in 7 target areas (based on historical costs).		20,000,000		19,000,000		16,000,000
Non-commute & special events program: Provide annual "placeholder" amounts for new research and demonstration projects for non-commute.		10,000,000		9,000,000		8,000,000
Freight & commercial vehicle incentives program: Provide annual "placeholder" amounts for new research and demonstration projects for freight and commercial vehicles.		8,000,000		7,000,000		6,000,000
Custom bus service: Provide funding (based on historical costs) for custom bus service in 7 target areas (20 routes for 4 lane, 17 routes for 6 lane, 15 routes for 8 lane).		22,000,000		20,000,000		15,000,000
Demonstration projects: Provide annual "placeholder" amounts to test new variations on existing services and innovations.		5,000,000		5,000,000		5,000,000
Capital and Operating Subtotals		65,000,000		60,000,000		50,000,000
Total 20-year costs		$65,000,000		$60,000,000		$50,000,000

TOTAL SR 520 TDM PROGRAM	**4-Lane Alternatives**		**6-Lane Alternatives**		**8-Lane Alternatives**	
Components	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**	**Capital Costs**	**Operating Costs**
Capital and Operating Subtotals	19,500,000	310,500,000	19,500,000	265,500,000	19,500,000	225,500,000
Total 20-year costs		$330,000,000		$285,000,000		$245,000,000

Overlap of Investment with I-405 TDM Program

Although the recommended SR 520 TDM Program is in the same format as the I-405 TDM Program to help facilitate potential integration of the two programs in the future, the level of investment was developed independently from the I-405 program since it is unknown at this time if that program will be funded. While much of the estimated TDM investments for both corridors do not overlap since they serve different users in different corridors, there is some overlap between the two programs. The overlap is primarily due to duplication of staff or incentives that support jurisdictions that are in both the SR 520 and I-405 corridors. That overlap would be eliminated as part of the funding-related implementation planning process for the two corridors.

Effectiveness of TDM Program

Estimating the effectiveness of the TDM Program will be done by two different methods. One method is to estimate the effectiveness of the strategies within the TDM Program by the degree to which a target is met and/or reporting numbers are achieved. The other method is to estimate the impacts of the entire program on trip-making at the highway system level, primarily by measures related to the program's goal to reduce growth of VMT within the overall SR 520 corridor and to increase person-throughput on the bridge. Estimates for both methods will be by the number of lanes in an alternative: one estimate focuses on effectiveness of individual strategies or programs by showing target numbers against which progress would be measured and the other estimate focuses on the effectiveness of the entire TDM program by showing impacts on trip-making with the targets or impacts varied (if appropriate) by the number of lanes that would be built in each alternative.

Estimating the Effectiveness of Strategies Within the TDM Program

Potential measures being considered for evaluating the effectiveness of strategies within the TDM Program to meet targets include:

- Number of new vanpoolers
- Number of employees within new voluntary CTR programs
- Increases in effectiveness of existing CTR programs at work sites
- Numbers of employees who shift to telecommuting or compressed work schedules
- Public awareness levels among target audiences due to public education program
- Percent achievement of TDM goals in interlocal agreement
- Number of new transportation management associations
- Number of new transit-oriented development
- Number of grants to fix local connectivity problems
- Number of new leased park-and-ride stalls

The measures reflect the variety of strategies within the program and the need to have different measures for the different programs. Information gathered from corridor jurisdictions, transit agencies, existing TDM programs, other support and marketing programs, and TDM and marketing experts on the current performance of local TDM programs were used to develop an estimate of targets for some of the TDM strategies shown in the following table.

Some of the targets, such as number of new vanpoolers and number of new leased park-and-ride stalls, were calculated (i.e., 5 new vanpoolers per new vanpool). The other targets used the gathered information to estimate targets that are appropriate by typical industry standards or based on professional judgment. Many of the targets, such as those for vanpooling, will be the same for each alternative but some targets, such as those for CTR strategies, will vary by alternative depending on how much benefit can be captured from TDM investments based on how much the TDM-supportive infrastructure and services are within the alternative.

Potential Measures of Effectiveness of Strategies (Examples)	Measure - - Degree to Which Target is Met and/or Reporting Numbers are Achieved		
	4 Lanes	6 Lanes	8 Lanes
Number of New Vanpoolers	1300	1300	1300
Increases in Effectiveness of Existing CTR Programs at Work Sites (existing 7.5%)	+1.5% (9 % Total)	+2.5% (10 % Total)	+1% (8.5 % Total)
Numbers Who Shift to Telecommuting or Compressed Work Schedules	Increase telecommute at CTR work sites by 50%		
Public Awareness Levels among Target Audiences for Public Education	10% above baseline standard		
Percent Achievement of TDM Goals in Interlocal Agreement	80% of targets	80% of targets	80% of targets
Number of new Transportation Management Associations	1-2	1-2	1-2
Number of Grants to Fix Local Connectivity Problems	Average 10 per year	Average 10 per year	Average 10 per year
Number of New Leased Park & Ride Stalls	1900	1900	1900

Estimating the Impacts of the Entire Program on Trip-Making at the Highway System Level

Potential measures being considered for evaluating the impacts of the entire program on trip-making include:

- Reduce growth of daily VMT in the overall corridor
- Reduce growth of AM peak in the overall corridor
- Increase person-throughput on bridge
- Trips shifted from peak
- Trips eliminated
- Increase average vehicle occupancy
- Increase in use of HOVs
- Increase commute mode split

The variety of measures reflect the need, when determining which performance measure to use for evaluating the effectiveness of the entire TDM Program, to include consideration that the various strategies within the program focus on different markets which results in a wide variety of measures being used to capture the impact of TDM strategies on the transportation system (i.e. mode split for vanpooling, VMT reduction for telecommuting). In addition, the effectiveness of various strategies are often recorded at a site-specific or area-level. Converting and combining the different effectiveness measures for the various strategies into one measure at a highway system level may not provide an accurate assessment of the impact of the entire program. This may result in the need for multiple measures being used that capture only portions of the program but not the entire program by combining the effectiveness of strategies that have similar impacts into their related measures (i.e., combining the effectiveness of all the strategies that primarily reduce VMT, all the strategies that primarily increase HOV, etc.).

Another consideration when estimating the effectiveness of the entire program is that assumptions for TDM in the Puget Sound Regional Council's model cannot be achieved without investments from the TDM program. What portion of the program is needed to meet the model's assumptions for the region will need to be determined and will be examined during alternative analysis.

Information from the effectiveness estimates previously calculated for the I-405 TDM Program was a primary source for estimates of the impacts of the entire SR 520 TDM program on trip-making shown in the table below.

Potential Measures of Impacts on Trip-Making in the SR 520 Corridor (Examples)	**Estimated as Attributed to TDM Program (may already be included in model to some degree)**		
	4 Lanes	**6 Lanes**	**8 Lanes**
Reduce Growth of Daily VMT in Overall Corridor	2-5%	4-7%	3-6%
Reduce Growth of AM Peak VMT in Overall Corridor	7-12%	12-18%	10-15%
Increase Person-Throughput on Bridge	6-8%	8-10%	6-8%

The effectiveness of the TDM strategies was determined by conducting a thorough review of national and local research on the effectiveness of the TDM strategies included within the program. Empirical information from well-documented local examples, such as the Vanpool Market Study and Washington's Commute Trip Reduction (CTR) program, estimates from the Puget Sound Regional Council (PSRC) and information from local TDM experts were used as the primary sources for determining the effectiveness of the strategies within the program. Information from national examples was used as a secondary source. The gathered information was used to estimate the effectiveness of each major element for reduction in daily, AM peak and PM peak Vehicle Miles Traveled (VMT). The effectiveness for each major element was then reduced to help ensure that the effectiveness of overlapping strategies was not double-counted and to account primarily only for commute trips during AM and PM peaks. The estimated effectiveness of the five major elements was then combined for a total estimated effectiveness, by daily and AM peak VMT reduction, for the TDM program.

This estimate will be refined in late summer or early fall when information from the FTA grant case studies becomes available. The case studies are testing the potential effectiveness of various TDM strategies, at a case study area level and highway system level, within areas that have a variety of urban forms and TDM markets. The case studies will provide information, and a computerized spreadsheet analytical tool, on the effectiveness of selected TDM strategies within ten key activity areas along SR 520. The case studies are the first attempt in the region to develop a tool that can estimate the effectiveness of TDM and land use strategies that cannot be modeled at the highway system level and will be a valuable tool in helping to quantifying the impacts of TDM strategies.

As monitoring for the SR 520 TDM Program is further developed, other measures that may not be typically used in transportation planning (such as a suggestion to consider person-throughput on the bridge to be as defined as “average person miles per hour”) will be given further thought. Consistency with the Puget Sound Regional Council’s congestion monitoring program will also be considered during the process of determining which measures to use for monitoring the TDM Program.

Implementation of the SR 520 TDM Program

An implementation plan for the SR 520 TDM Program will be developed under the same grant from FTA that is funding work for the case studies and for the development of the Corridor TDM and Land Use agreement. Work on the plan will be coordinated with corridor jurisdictions, transportation and TDM providers, employers, non-public sector stakeholder groups and the region's TDM Roundtable to outline the interconnected actions needed to implement the program.

The plan would include:

- A schedule of implementation including identification of "early action" items,
- Roles and responsibilities of the various implementers of the program,
- Administrative structure for the programs,
- Framework to tie into the monitoring and oversight process in the corridor agreement,
- Framework to integrate with existing local, regional and state TDM programs, and
- Framework to integrate with the I-405 or other corridor TDM programs.

Work on the implementation plan is expected to start in the fall, after information from the case studies becomes available. Work on the implementation plan will also be coordinated with implementation planning work starting this fall for the I-405 corridor funded under a FHWA grant. This work will further refine the TDM effectiveness analytical tool developed in the FTA grant including developing a database to correlate travel behavior to land use development patterns and stated preference surveys for TDM and possibly for residential land use.